

Shipping...

# BLOCK AND BRACE FOR BEST RESULTS

WHOA, GET A LOAD OF THIS MESS!

OH MAN, THE SUPPLIES WE ORDERED ARE TRASHED.

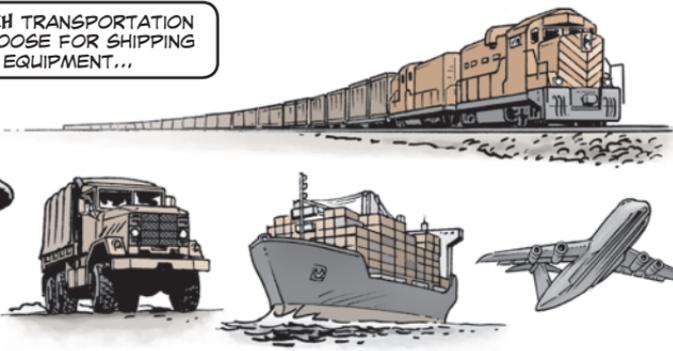
LOOKS LIKE YOU WERE RIGHT, MASTER SERGEANT. BUT HOW'D YOU KNOW THIS TRAILER'S CONTENTS WERE JACKED UP?

MY BUDDY ACE HERE GAVE THE ALERT... HE'S GOT A DOGGONE SIXTH SENSE 'BOUT BAD BLOCKING AND BRACING!

WHAT HAPPENED!?

Ruff  
Ruff

NO MATTER WHICH TRANSPORTATION METHOD YOU CHOOSE FOR SHIPPING CARGO OR EQUIPMENT...



...IT'S **CRITICAL** TO USE THE **CORRECT** BLOCKING AND BRACING TECHNIQUES FOR SECURING CARGO INSIDE SHIPPING CONTAINERS.

BECAUSE CONTAINERIZED CARGO/ EQUIPMENT MAY TRAVEL BY LAND, SEA AND AIR, IT **MUST BE SECURED** TO WITHSTAND EVEN THE MOST DEMANDING CONDITIONS.

IF YOU BLOCK, BRACE AND LOAD CARGO RIGHT, YOU HELP ENSURE IT ARRIVES IN THE SAME CONDITION AS WHEN IT WAS PACKED. THAT **MINIMIZES** DELAYS AND COSTS FROM DAMAGE IN TRANSIT.

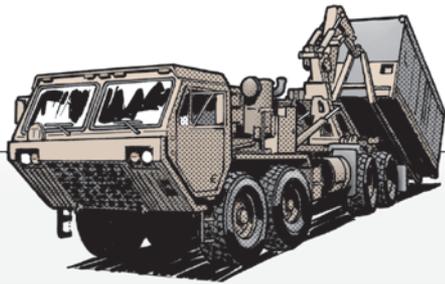
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WHEN BLOCKING AND BRACING CARGO, YOU CAN USE WOOD, PLYWOOD OR MECHANICAL DEVICES TO PREVENT MOVEMENT.

NO MATTER WHAT MATERIALS YOU CHOOSE, HERE ARE SOME IMPORTANT POINTS TO REMEMBER...

- Containers loaded on rail cars must be able to withstand an impact of up to 8 mph caused by coupling rail cars in the rail yard.
- 20-ft containers picked up by palletized loading system (PLS) trucks tilt to approximately 35-degree angles during the loading process.



- All containers are subject to varying g-forces during transit.
- Ocean voyages encounter a variety of weather conditions. That means containers will be subjected to pitching, rolling, heaving, surging, yawing, swaying or a combination of these forces.

### Where to Start

BEFORE YOU CAN BLOCK AND BRACE CARGO, YOU MUST HAVE THE RIGHT MATERIALS. HERE ARE SOME COMMON OPTIONS...

- **Lumber.** Use as filler for decking, blocking, bracing and constructing partitions. It should be kiln-dried, heat-treated and stamped per the Army's Wood Packaging Material Program. Select lumber specifically made for blocking and bracing cargo in containers. Common lumber sizes used in containers are 1x4, 1x6, 2x4, 2x6 and 4x4 inches.



- **Plywood.** Use for container partitions, dividers and secondary decking. It should be clean and dry. Plywood is not easily affected by changes in moisture content, so it's a good choice when high moisture levels are present.
- **Fiberboard.** Available in sheets, rolls and pre-scored structural shapes for light-duty bracing applications. Use it for dividers, decks or partitions. If you choose fiberboard or similar materials, make sure the strength and moisture resistance stays intact. Temperature changes are common when loaded containers are transported over long distances, especially in winter. This can cause condensation to form. When that happens, fiberboard delaminates, losing its structural stability.

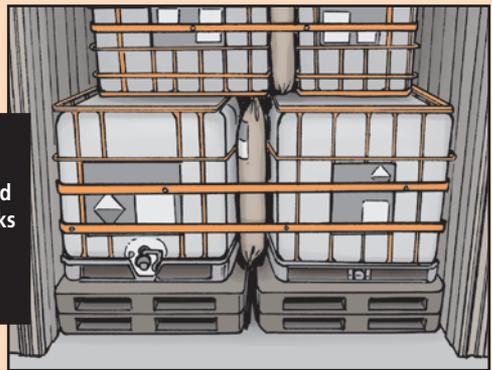


- **Dunnage.** Normally a by-product or scrap material. Use to fill voids, block and brace, and protect and secure container contents.

- **Inflatable air bags (IABs).** Available in paper or rubber and may be reusable or disposable. IABs are suitable for light- and medium-duty bracing. Note that IABs cannot prevent cargo from moving when subjected to impacts, such as those from rail car couplings. Use them to fill voids and add protection to containerized cargo.

- **Strapping.** Heavy-duty steel strapping (banding), tempered for maximum tensile strength and ductility, can absorb impact shocks without breaking. It's one of the most versatile tools for securing cargo in dry-cargo containers.

- **Nails/Nailing.** Use in wood blocking/bracing or securing anchor plates. When nailing into a container floor, nails should penetrate a minimum of two-thirds of the floor's thickness. Nails must not be too long or too thick. Nail in a staggered pattern to avoid splitting lumber.



## Three Keys to Cargo Success

FACTORS TO CONSIDER WHEN LOADING CONTAINERS INCLUDE **WEIGHT DISTRIBUTION, USE OF SPACE, AND CARGO VARIATION/COMPATIBILITY.**

HERE ARE **MORE TIPS** FOR SHIPPING SUCCESS...



- Place cushioning material between items.
- Use dunnage to fill voids and prevent movement and chafing damage.
- Avoid loading containers holding liquids above dry cargo.
- If dry and liquid cargos must be loaded on the same level, use dunnage or pallets to raise the dry cargo off the ground to prevent damage in the event of a leak.

- Proper placement of packaged items is important. Even dense cargo like crates can be damaged if loaded improperly. To reduce crushing risk, avoid placing heavy loads next to lighter ones. Likewise, don't stack heavier items above lighter ones.

**HALP! YOU'RE CRUSHING MY CONTENTS.**



**MJAHHAH!**  
IN CARGO SPACE,  
**NO ONE CAN HEAR YOU SCREAM!**

**BOTTOM LINE-**  
IT'S THE **SHIPPER'S RESPONSIBILITY** TO ENSURE THAT CARGO IS SECURED TO WITHSTAND ANY COMBINATION OF SITUATIONS.

THERE ARE ALSO STATE, FEDERAL, INTERNATIONAL AND MARITIME LAWS AND GUIDELINES THAT **MUST BE FOLLOWED** WHEN SHIPPING CARGO.



FOR **MORE SHIPPING GUIDANCE**, CONTACT THE LOGISTICS SUPPORT ACTIVITY'S PACKAGING, STORAGE AND CONTAINERIZATION CENTER AT DSN 795-7257, (570) 615-7257, OR EMAIL:

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